

Description

WINDOW TYPE AIR CONDITIONER

Technical Field

- [1] The present invention relates to a window type air conditioner, and more particularly, to a window type air conditioner capable of decreasing a flow resistance and increasing an air volume by making an air stream smooth.

Background Art

- [2] In general, an air conditioner is provided with a refrigerating cycle constituted with a compressor, a condenser, a capillary tube, a heat exchanger, etc., and properly supplies cool air generated from an evaporator and warm air generated from the condenser indoors according to the indoor condition, thereby maintaining the indoor circumstance comfortably.
- [3] The air conditioner is divided into a window type air conditioner and a separated type air conditioner according to an installation method. The window type air conditioner is installed at the window, etc. under the state that an outdoor unit and an indoor unit are integrally assembled in one case, and the separate type air conditioner is respectively installed at the outdoor and the indoor under the state that the outdoor unit and the indoor unit are separated from each other.
- [4] FIG. 1 is a sectional view showing a window type air conditioner in accordance with the conventional art.
- [5] The conventional window type air conditioner comprises: a case 100 of which one side is positioned at the outdoor side and another side is positioned at the indoor side; an outdoor unit 110 installed at the outdoor side of the case 100 and heat-exchanged with the outdoor air; an indoor unit 120 installed at the indoor side of the case 100 and heat-exchanged with the indoor air; and a compressor 130 for compressing a refrigerant.
- [6] The case 100 is installed at the wall that divides the outdoors and the indoors, and one side of the case 100 is positioned at the outdoor side and another side thereof is positioned at the indoor side. An outdoor air suction port 102 for sucking the outdoor air is formed at both lateral surfaces of the case 100 positioned at the outdoor side. Also, an outdoor air discharge port 104 for discharging the air heat-exchanged while passing through the outdoor unit 110 outdoors is formed at the rear surface of the case 100. At the front surface of the case 100 positioned at the indoor side, an indoor air suction port 106 for sucking the indoor air and an indoor air discharge port 114 for

discharging the air heat-exchanged while passing through the indoor unit 120 indoors are respectively formed.

- [7] The indoor unit 120 is composed of: an indoor heat exchanger 122 installed inside the case 100 positioned at the indoor side, for heat-exchanging the indoor air; and a centrifugal fan 124 opposite to the indoor heat exchanger 122, for generating a blowing force so that the indoor air can pass through the indoor heat exchanger 122.
- [8] An orifice 126 for guiding the air that has passed through the indoor heat exchanger 122 to the centrifugal fan 124 is formed between the indoor heat exchanger 122 and the centrifugal fan 124. An air guide passage 128 for guiding the air that has passed through the centrifugal fan 124 to the indoor air discharge port 108 is installed at the upper side of the centrifugal fan 124.
- [9] The outdoor unit 110 is composed of: an outdoor heat exchanger 112 installed inside the case 100 positioned at the outdoor side and connected to a compressor 130 by a refrigerant pipe thus to be heat-exchanged with the outdoor air; and an axial fan 114 opposite to the outdoor heat exchanger 112, for generating a blowing force to suck the outdoor air and thus to discharge it to the outdoor heat exchanger 112.
- [10] The outdoor heat exchanger 112 is mounted in a shroud 116. The shroud 116 induces air blown by the axial fan 114 to the outdoor heat exchanger 112, and divides a suction side and a discharge side. At the front side of the outdoor heat exchanger 112, formed is an orifice 118 for sucking outdoor air and attenuating a velocity vector of the outdoor air in a radius direction due to a characteristic of the axial fan 114.
- [11] As shown in FIG. 2, the shroud 116 is provided with the axial fan 114 and the orifice 118 for sucking air at the front side thereof. The rear side of the shroud 116 is opened so that the air that has passed through the outdoor heat exchanger 112 can be discharged through the outdoor air discharge port 104. The shroud 116 is formed as a hexahedral shape having a similar size to the outdoor heat exchanger 112.
- [12] A division plate 150 for dividing the outdoor unit 110 and the indoor unit 120 is installed inside the case 100, and a driving motor 140 for driving the centrifugal fan 124 and the axial fan 114 is mounted at the division plate 150.
- [13] Operation of the window type air conditioner in accordance with the conventional art will be explained in more detail. When a power source is applied to the air conditioner, the compressor 130 and the driving motor 140 are driven thus to heat-exchange the outdoor air at the outdoor unit 110 and to heat-exchange the indoor air at the indoor unit 120.
- [14] More specifically, when the centrifugal fan 124 is driven, the indoor air is sucked

through the indoor air suction port 106 thus to be cooled while passing through the indoor heat exchanger 122. Then, the indoor air is discharged indoors through the indoor air discharge port 108.

[15] When the axial fan 114 is driven, the outdoor air is sucked to an inner space 142 of the case 100 through the outdoor air suction port 102 formed at both lateral surfaces of the case 100. The outdoor air sucked into the case 100 is sucked into the shroud 116 through the orifice 118 thus to condense a refrigerant while passing through the outdoor heat exchanger 112. Then, the outdoor air is discharged outdoors through the outdoor air discharge port 104.

[16] As shown in FIG. 3, the outdoor air suction port 102 is formed at both lateral surfaces of the case 100, the outdoor air discharge port 104 is formed at the rear surface of the case 100, and the axial fan 114 is operated. Therefore, the outdoor air is sucked in a radius direction through the outdoor air suction port 102 and is curved to an approximate right angle direction thus to be discharged to an axial direction of the axial fan 114.

[17] However, in the conventional window type air conditioner, an edge of the shroud 116 is formed as a right angle. According to this, the outdoor air sucked in the radius direction through the outdoor air suction port 102 formed at the lateral surface of the case 100 collides with the edge of the shroud 116, and at the same time generates a flow resistance thereby to lower an air volume.

Disclosure

[18] Therefore, it is an object of the present invention to provide a window type air conditioner capable of minimizing a flow resistance of outdoor air and increasing an air volume by improving a structure of a shroud.

[19] To achieve these objects, there is provided a window type air conditioner comprising: a case of which one side is positioned at the outdoor side and another side is positioned at the indoor side; an axial fan mounted in the case, for blowing air in a radius direction thereof; an outdoor heat exchanger for heat-exchanging outdoor air blown by the axial fan; and a shroud having the outdoor heat exchanger therein and guiding the air blown by the axial fan, wherein an inclination surface is formed at an edge of the shroud in order to smoothly flow air introduced in a radius direction.

[20] The shroud is provided with an orifice for sucking air at a front side thereof, and a rear side thereof is opened so that air that has passed through the outdoor heat exchanger can be discharged to an outdoor air discharge port. An inclination surface is formed at four edges of the shroud.

- [21] The shroud is composed of: a front surface where the orifice for sucking air is formed; a lateral surface covered by an outer lateral surface of the outdoor heat exchanger; and an inclination surface formed at four edges where the front surface and the lateral surface contact each other.
- [22] The inclination surface is formed as a triangular plane by chamfering four edges of the shroud.

Description of Drawings

- [23] FIG. 1 is a sectional view showing a window type air conditioner in accordance with the conventional art;
- [24] FIG. 2 is a perspective view showing an outdoor unit of the window type air conditioner in accordance with the conventional art;
- [25] FIG. 3 is an operational state view showing of the outdoor unit of the window type air conditioner in accordance with the conventional art;
- [26] FIG. 4 is a sectional view showing a window type air conditioner according to one embodiment of the present invention;
- [27] FIG. 5 is a perspective view showing an outdoor unit of the window type air conditioner according to one embodiment of the present invention; and
- [28] FIG. 6 is an operational state view showing the outdoor unit of the window type air conditioner according to one embodiment of the present invention.

Best Mode

- [29] Hereinafter, a window type air conditioner according to the present invention will be explained with reference to the attached drawings.
- [30] Even if a plurality of preferred embodiments can exist in the present invention, the most preferred embodiment will be explained hereinafter.
- [31] FIG. 4 is a sectional view showing a window type air conditioner according to one embodiment of the present invention.
- [32] The window type air conditioner according to one embodiment of the present invention comprises: a case 10 formed at a wall that divides the indoor side and the outdoor side thus to have one side positioned at the indoor side and another side exposed to the outside; an indoor unit 20 positioned at the indoor side of the case 10 thus to be heat-exchanged with the indoor air; an outdoor unit 30 positioned at the outdoor side of the case 10 thus to be heat-exchanged with the outdoor air; a compressor 40 for compressing a refrigerant; etc.
- [33] An indoor air suction port 12 for sucking the indoor air and an indoor air discharge port 14 for discharging the air that has been heat-exchanged while passing through the

indoor unit 20 indoors are separately formed up and down at the front surface of the case 10 positioned at the indoor side.

- [34] A division plate 40 for dividing the indoor unit 20 and the outdoor unit 30 is installed in the case 10, and a driving motor 50 for driving a centrifugal fan 24 and an axial fan 34 is mounted at the division plate 40.
- [35] Also, an outdoor air suction port 16 for sucking the outdoor air is formed at both lateral surfaces of the case 10 positioned at the outdoor side, and an outdoor air discharge port 18 for discharging the air that has passed through the outdoor unit 30 outdoors is formed at the rear surface of the case 10 positioned at the outdoor side.
- [36] The indoor unit 20 is composed of: an indoor heat exchanger 22 for passing the indoor air and thereby cooling; and a centrifugal fan 24 arranged in the indoor heat exchanger 22 and connected to the driving motor 50, for generating a blowing force so that the indoor air sucked into the indoor air suction port 12 can pass through the indoor heat exchanger 22.
- [37] An orifice 26 for guiding the indoor air that has passed through the indoor heat exchanger 22 to the centrifugal fan 24 is formed between the indoor heat exchanger 22 and the centrifugal fan 24. An air guide passage 28 for guiding the air that has passed through the centrifugal fan 24 to the indoor air discharge port 14 is formed at the upper side of the centrifugal fan 24.
- [38] As shown in FIG. 5, the outdoor unit 30 is composed of: an outdoor heat exchanger 32 for heat-exchanging the outdoor air sucked through the outdoor air suction port 16; an axial fan 34 for generating a blowing force so that the outdoor air can be sucked thus to pass through the outdoor heat exchanger 32; and a shroud 36 having the outdoor heat exchanger 32 therein and separating a suction side of the outdoor heat exchanger 32 from a discharge side.
- [39] The shroud 36 is provided with an orifice 38 for sucking outdoor air and attenuating a velocity vector of the outdoor air in a radius direction due to a characteristic of the axial fan 34 at the front surface thereof. The rear surface of the shroud 36 is open so that the outdoor air that has passed through the outdoor heat exchanger 32 can be discharged through the outdoor air discharge port 18. The shroud 36 is formed as a hexahedral shape having a similar size to the outdoor heat exchanger 32.
- [40] The shroud 36 has a width similar to that of the outdoor heat exchanger 32, and has an inclination surface 60 at four edges thereof. The inclination surface 60 prevents the outdoor air introduced in a radius direction through the outdoor air suction port 16 from colliding with the four edges of the shroud 36.

- [41] That is, the shroud 32 is composed of: a front surface 64 where the orifice 38 is formed; a lateral surface 62 covered by an outer lateral surface of the outdoor heat exchanger 32; and an inclination surface 60 formed at four edges where the front surface 64 and the lateral surface 62 contact each other.
- [42] The inclination surface 60 is formed as a triangular plane having a certain inclination angle by chamfering four edges of the shroud 32 of a right angle, thereby smoothly flowing the air introduced into the orifice 38.
- [43] The edge where the front surface 64 and the lateral surface 62 of the shroud 36 contact each other is formed as a curved line, thereby making an air flow smooth.
- [44] Operation of the window type air conditioner will be explained as follows.
- [45] When a power source is applied to the air conditioner, the compressor 40 is driven thus to circulate a refrigerant, the centrifugal fan 24 is driven thus to heat-exchange the indoor air by the indoor heat exchanger 22, and the outdoor axial fan 34 is driven thus to heat-exchange the outdoor air by the outdoor heat exchanger 32.
- [46] At this time, the indoor unit 20 is operated as follows. When the indoor centrifugal fan 24 is driven as a power source is applied to the driving motor 50, the indoor air is sucked into the case 10 positioned at the indoor side through the indoor air suction port 12 formed at the front surface of the case 10 thus to be cooled while passing through the indoor heat exchanger 22. The cooled air is guided by the air guide passage 28 thus to be discharged indoors through the indoor air discharge port 14 formed at the upper side of the front side of the case 10.
- [47] Also, the outdoor unit 30 is operated as follows. As shown in FIG. 6, when the outdoor axial fan 34 is driven as a power source is applied to the driving motor 50, the outdoor air is sucked into the case 10 positioned at the outdoor side through the outdoor air suction port 16 formed at both lateral surfaces of the case 10. Then, the outdoor air is introduced into the shroud 36 through the orifice 38 thus to be heat-exchanged while passing through the outdoor heat exchanger 32. Subsequently, the outdoor air is discharged outdoors through the outdoor air discharge port 18 formed at the rear side of the case 10.
- [48] The inclination surface 60 is formed at four edges of the shroud 36, thereby preventing the outdoor air sucked through the outdoor air suction port 16 from colliding with the edge of the shroud 36. According to this, a flow resistance of the outdoor air is reduced thus to increase an air volume.
- [49] Since the inclination surface 60 is formed by removing four edges of the shroud 36 by a chamfering process, a volume of an air suction region inside the case 10

positioned at the outdoor side is increased as much as the removed amount. According to this, an air suction is smoothly performed thereby to enhance a function of the air conditioner.

- [50] In the air conditioner according to the present invention, since the inclination surface is formed at the edge of the shroud, the air sucked through the outdoor air suction port in a radius direction is prevented from colliding with the edge of the shroud. Therefore, an air flow is smoothly performed and thereby an air volume is increased.
- [51] Also, since the edge of the shroud is removed by a chamfering process, a volume of the air suction region inside the case is increased. According to this, an air suction amount is increased and a function of the air conditioner is enhanced.
- [52] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.